UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1
5 Post Office Square
Boston, MA 02109-3912

March 27, 2017

Darren Austin
Office of Air Resources
Department of Environmental Management
235 Promenade Street, Room 230
Providence, RI 02908

Dear Mr. Austin:

Thank you for the opportunity to review and comment on your draft exceptional event demonstration, shared with us on March 3, 2017, for the Ft. McMurray wildfire. The Rhode Island Department of Environmental Management (RI DEM) is proposing the demonstration under the exceptional events rule at 40 CFR 50.14 to show that the elevated ozone concentrations recorded at the East Providence, West Greenwich, and Narragansett monitoring locations on May 25 and 26, 2016 were the result of high levels of ozone and ozone precursors being transported within the smoke plume to Rhode Island.

EPA Region 1 has reviewed RI DEM's draft demonstration and is providing comments to strengthen the discussion. You will find the Agency's comments in the enclosure. In addition to the comments in the enclosure, we are also providing an electronic markup of the draft demonstration with recommendations for additional clarifying and editorial revisions.

If you have any questions regarding this matter, please contact Eric Wortman at 617-918-1624, or Catie Taylor at 617-918-8607.

Sincerely,

David B. Conroy, Chief
Air Programs Branch

Enclosure

cc: Douglas McVay, RI DEM
Laurie Grandchamp, RI DEM
Gina Friedman, RI DEM

Enclosure

EPA Comments on Rhode Island's Draft Exceptional Events Demonstration for the Ft. McMurray Wildfire Event in May 2016

The Rhode Island Department of Environmental Management (RI DEM) provided EPA a draft exceptional events demonstration on March 3, 2017 for air quality impacts from the 2016 Ft. McMurray wildfire. The draft submittal requests the exclusion of 8-hr ozone (O_3) monitoring data on May 25 and 26, 2016 for the East Providence, West Greenwich, and Narragansett monitoring locations. The comments below are based on EPA's review of the draft submittal.

1. RI DEM should format the narrative document to include page numbers, table of contents, table and figure numbers, and appendices. This will make the overall organizational structure of the demonstration easier to follow for the reader and will allow for easier references within the narrative itself.

2. RI DEM should clearly indicate in Section 1 of the document the exceptional events demonstration is being requested for the East Providence, West Greenwich, and Narragansett monitoring locations for the period of May 25 and 26, 2016. A map of the three monitoring locations should also be provided.

3. Many of the figures in the demonstration do not contain a thorough description in the narrative text. RI DEM should describe each figure in enough detail to provide the public with an understanding of the data being illustrated. This will help reviewers navigate through all the information that is provided in the demonstration. The figures should only contain information necessary to convey the message and be large enough to distinguish the data being presented. RI DEM should clearly indicate which slides include time-lapse animation to help the reader navigate illustrations in the referenced slide deck. It's important that the use of animated technology be easily viewed by the public as part of the public comment period.

4. RI DEM should summarize all the findings discussed throughout the document that formulates a clear causal relationship of the Ft. McMurray smoke and the proposed O_3 concentrations being excluded. RI DEM needs to clearly demonstrate that wildfire emissions were transported from Ft. McMurray to each monitor and how those wildfire emissions impacted O_3 concentrations. RI DEM should include satellite photos or time-lapse animations of smoke or other parameters which show movement of the plume from Ft. McMurray to Rhode Island through May 28 as part of the discussions in the Conceptual Model section of the document. Satellite evidence of smoke over Rhode Island or eastern Massachusetts during May 25 and May 26 should also be included. This will illustrate the location of the smoke plume during the duration of the event.

5. RI DEM should provide webcam pictures from any cameras in or nearby Rhode Island to help show that smoke was present in Rhode Island during May 25 and 26. Connecticut Department of Energy and Environment (CT DEEP) provided webcam pictures from

Cornwall and Talcott Mountain in its demonstration, and it may be useful to include these in your demonstration. Additionally, there are also high resolution cameras in the Boston area available at www.hazecam.net/. An archive of pictures taken during May 2016 should be available from Northeast States for Coordinated Air Use Management. This may provide information to support that smoke was at ground level in southeastern New England.

6. RI DEM should provide additional HYSPLIT trajectories to help illustrate the movement of the smoke plume from Ft. McMurray to Rhode Island. It may be beneficial to show forward trajectories from Ft. McMurray, as well as back trajectories from other areas in New England, New York and the upper Midwest where smoke was evident. In addition to the back trajectories in slides 19 and 22, RI DEM should include back trajectories for the West Greenwich and East Providence monitors for different times during the day on both May 25 and 26, 2016.

7. RI DEM should evaluate the Chemical Speciation Network (CSN) data at both the East Providence site and at additional upwind CSN sites. This could show evidence of smoke at ground level at upwind locations prior to May 25, and at the East Providence site during May 25 and 26. Alternatively, RI DEM can include the analysis of CSN data already completed by the CT DEEP and include this analysis as an appendix.

8. RI DEM should provide further discussions about the Black Carbon (BC) measurements during the event and plot delta C data for the East Providence, Urban League and Hayes Street sites. This may provide information to support that smoke was at ground level in Rhode Island.

9. RI DEM uses the term "non-event" day to describe a typical O_3 exceedance day. However, three of the four typical O_3 exceedance days included graphics of Hazard Mapping System (HMS) smoke analysis and narrative discussion about smoke in the area. RI DEM should select other days that are representative of a more typical O_3 exceedance day, without any influence from smoke. Moreover, instead of including slides 55-58 which present duplicate data already contained in slides 50-54, we would suggest adding hourly plots of O_3, carbon monoxide (CO), fine particulate matter ($PM_{2.5}$,) and BC for typical O_3 exceedance days at the East Providence site. This should assist the reader with understanding what CO, $PM_{2.5}$ and BC look like during typical O_3 exceedance days.

10. RI DEM should provide a comparison of O_3 concentrations on meteorologically similar days for each of the three monitors, i.e., a "similar day or matching day analysis." Showing other days with similar back trajectories and similar meteorology to May 25 and 26, 2016 (e.g. high temperatures and sunny skies) with low O_3 concentrations measured at these monitors could help demonstrate the uniqueness of O_3 concentrations on May 25 and 26. EPA

provides guidance on conducting a "matching day analysis" in Section 3.6.4 of the September 16, 2016 wildfire guidance document.[1]

11. On Slide 1 and the table on page 13 in the narrative, RI DEM should consider adding two columns to indicate the critical 4th high value for 2017 to help demonstrate the regulatory significance of the exceptional event for the three monitoring sites. For example, the table provided below shows that with the May 25 and 26 data excluded, the 4th high 8-hour O_3 average in 2016 at Narragansett drops from 71 ppb to 66 ppb. The resulting difference in the 2017 critical value is significant (i.e., 70 ppb versus 65 ppb) and helps demonstrate the regulatory significance of this exceptional event demonstration.

	Current Values					Without May 25 - 26, 2016		
Site Name	4th High 2014	4th High 2015	4th High 2016	2014-2016 DV	2017 Critical Value	4th High 2016	2014-2016 DV	2017 Critical Value
East Providence	64	71	71	68	71	64	66	78
Narragansett	63	77	71	70	65	66	68	70
West Greenwich	67	70	75	70	68	70	69	73

12. An analysis of daily nitrogen oxide (NOx) emissions from upwind electric generating units during the 2016 O_3 season is a useful way to show that the May 25-26 time period was not a period of peak electricity demand in the Northeast with associated higher NOx emissions. RI DEM should include CT DEEP's analysis of NOx sources from EPA's Air Markets Program Data (AMPD) website as an appendix to its exceptional events demonstration.

13. If smoke from fires (Mexico/Yucatan) other than the Ft. McMurray fire are considered important in the narrative, then additional discussion related to fire-related smoke from these fires, their transport, and their potential effects on O_3 concentrations needs to be built into the narrative. As written, the contribution and significance of these additional fires is not described in this exceptional event request. It should either be better clarified that the demonstration focuses solely on the Ft. McMurray wildfire plume or the reference to other fires should be dropped from the demonstration narrative entirely.

[1] Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations, September 16, 2016. Available at https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance.